invention. A portable pen input type computer 41 shown in FIG.30, for example, has already been developed. The pen input type computer 41 is mounted with a display part 42 made of a thin liquid crystal display panel having B5 or A4 size, for example. A transparent touch panel which is not shown is provided to cover a front face of this display part 42. When an input pen 43 is moved to a close proximity of, touches or, lightly pushes on this touch panel, it is possible to detect the coordinate indicated by the pen 43. The display part 42 is of course not limited to the liquid crystal display, and the present invention is similarly applicable to cases where the display part 42 is made of a plasma discharge panel or a CRT. The pen input type computer 41 may have an internal structure shown in FIG.1, for example. In addition, the present invention is not only applicable to the pen input type computer 41, but is similarly applicable to a word processor, an electronic notebook or diary, a desk top apparatus coupled to a coordinate detecting apparatus, and various kinds of programmable apparatuses having a coordinate detecting apparatus such as cash dispensers.

Furthermore, the types of computer input roughly include the resistor layer type, the electrostatic coupling type and the electromagnetic induction type, but the present invention may employ any of such types of computer input. Moreover, the input is not limited to a pen input, and the present invention is applicable to a touch panel or the like which receives an input by the user's finger tips.

Next, a detailed description will be given of the embodiments of the present invention and the operation thereof, by referring to FIGS.1 through 30.

FIG.1 is a system block diagram showing the present invention.

In FIG.1, a CPU 1 carries out various

within the range of the comparison coordinates min and max when the card is placed within the card frame displayed on the screen 11 and the coordinates are input by pushing the positions of the holes or openings, cutouts or marks of the card. It is thus possible to judge that the authentication is acceptable if the input coordinates fall within the range of the comparison coordinates min and max, and that the authentication is not acceptable if the input coordinates do not fall within the range of the comparison coordinates min and max.

FIG.20 is a flow chart for explaining a process of learning the tolerable range in the present invention.

In FIG.20, a step S151 makes an input n. times. In other words, the card is placed within the card frame displayed on the screen 11, and the operation of inputting the coordinate by pushing the position of the hole or opening, cutout or mark of the card is repeated n times.

A step S152 makes a statistical analysis.

A step S153 calculates the tolerable range (Δx, Δy). These steps S152 and S153 obtains an average value, for example, based on a statistical analysis of the n coordinate values input in the step S151, and calculates as the tolerable range a neighboring range of the average value from the registered data.

Therefore, when the card is placed within the card frame 12 which is displayed on the screen 11 and the coordinates are input by pushing the positions of the holes or openings, cutouts or marks of the card by the pen, an average value of the input coordinates is obtained, and the tolerable range is calculated from a neighboring range of the average value from the registered data. Hence, even if the point where the coordinate input is made deviates depending on the

S195 into the key code.

A step S197 carries out a so-called password type security by discriminating whether or not the key converted from the coordinate of the ten-key in the step S195 matches the registered data with respect to the column of the numerical values (0, 1, 2, ..., 9) of the keys of the ten-key.

A step S198 carries out a process corresponding to the authentication result.

Therefore, the origin (x00, y00) and another specific point (x01, y01) are input on the coordinate input apparatus such as the tablet and the touch panel, so as to virtually set the software ten-key. Both the frame of the ten-key and the ten-key itself are not displayed. The card 34 is placed on the coordinate input apparatus, and the coordinates are input by pushing the positions of the holes or openings, cutouts or marks of the card 34 by the pen. The read input coordinates are converted into the numerical values indicating which keys of the ten-key have been pushed, and are compared with the registered data. It is judged that the authentication is acceptable if the compared data match, and that the authentication is not acceptable if the compared data do not match. As a result, it is possible to make the authentication by inputting a string of arbitrary numbers or the like from the tablet which cannot display the card frame or the like.

Of course, the authentication method using the software ten-key in accordance with the flow chart shown in FIG.23 may be replaced by another method such as that described above.

FIGS.24A and 24B respectively are diagrams for explaining the data structure for a case where the card position may be an arbitrary position on the tablet, touch panel or the like in the present invention.

The comparison results indicate the coordinates on the software ten-key to which the software ten-key comparison coordinates (x1', y1'), (x2', y2'), (x3', y3') and (x4', y4') belong. For example, in the case of a value (x12, y12), the affix "12" indicates a key having a numerical value "2" which is located at a second position of the first row out of the 4 rows of ten-keys each having keys having the numerical values "1", "2", "3", "4", "5", "6", "7", "8", "9" and "0".

The numerical values represent the comparison results by the numerical values. In this case, the numerical values are "2692".

Therefore, the card 34 is placed at an arbitrary position on the tablet 31, the touch panel or the like, and the position of the hole or opening, cutout or mark of the card 34 is pushed first by the pen to specify the card origin (x00, y00), and the position of the hole or opening, cutout or mark of the card 34 is pushed second by the pen to specify the other specific point (x01, y01), so as to set the software ten-key in a virtual manner within the computer system. Then, when the positions of the holes or openings, cutouts or marks of the card 34 at the point Nos. 1 through 4 are successively pushed third through sixth by the pen, the result is output as the numerical values "2692", for example.

FIG.25 is a flow chart showing a local ID authentication process carried out by the coordinate detecting microcomputer in the present invention.

In FIG.25, a step S201 decides whether or not an input exists by the coordinate detecting microcomputer 4. If the decision result in the step S201 is YES, the process advances to a step S202. On the other hand, a wait state is assumed if the decision result in the step S201 is NO.

The step S202 detects the input coordinates.